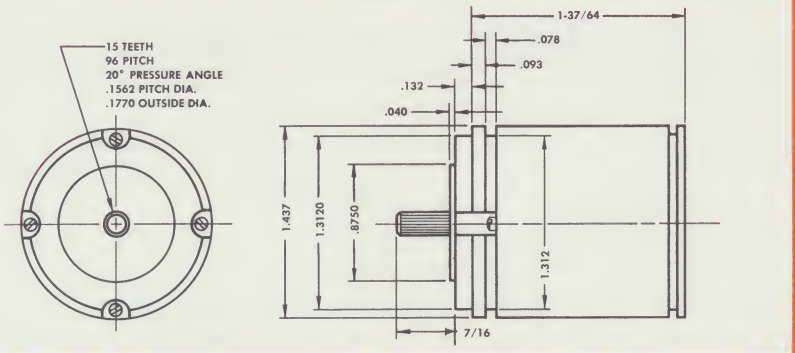
# "PIGGY-BACK"
## INERTIAL DAMPER
## ID15-100

## FEATURES

- Stabilizes servo hunting.
- Clamps onto any size 15 motor
- Improves loop performance, lower positional and velocity errors.
- Works equally well in 60 or 400 cps servo systems.

*A precision, anti-hunt device for instrument servos.*




**INDUSTRIAL CONTROL COMPANY, INC.**

**COMPONENT DIVISION** ● **FARMINGDALE, L. I., N.Y.**

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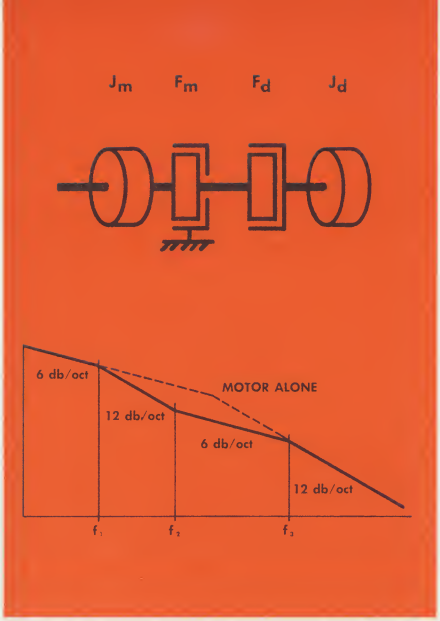
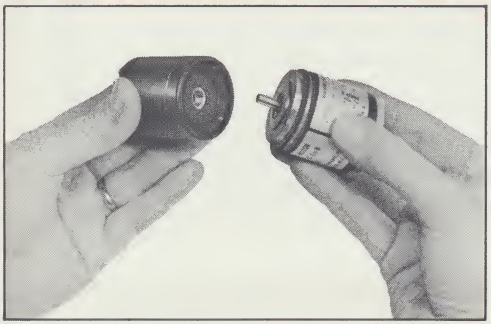
The ID15-100 is an anti-hunt device that is added to the size 15 servomotor to stabilize the servo loop. Designed with the "piggy-back" feature, it mounts quickly and directly onto the motor, much like a gear head. Its face and pinion duplicate those of the motor, and the assembled motor-damper can replace the motor itself in an existing gear train for improved servo performance.




## THEORY

In the ID15-100, a heavy flywheel is viscous-coupled to the motor's pinion. The equivalent mechanical circuit includes the motor's inertia and viscous damping coefficient ($J_m$ and $F_m$), the viscous coupler $F_d$, and the flywheel $J_d$. In steady state position or velocity, there is no relative movement between rotor and flywheel, and the servo performance is not affected. However, when the rotor is accelerating or hunting, the relative velocity difference generated couples the flywheel to the motor thru $F_d$. The resultant viscous torque drag on the rotor opposes its motion, decreases the hunting amplitude and stabilizes the servo loop.



The transfer function of the motor-damper combination is bounded by four asymptopes of 6 and 12 db/octave, and is defined by three corner frequencies. The damper establishes a 6 db/octave slope in the region of the motor's original corner frequency ($J_m/F_m$) and reduces the data phase shift. This improves amplitude and phase stability margins and permits higher stable loop gains with correspondingly lower static and velocity errors.

At 400 cps, the motor-damper combination has corner frequencies of .25, 1.3 and 25 cps. With a 60 cps size 15 motor, these become .35, 1.3 and 25 cps. Dampers with special characteristics to suit a particular problem may be obtained on special order.

## APPLICATIONS

With the "piggy-back" design, a few dampers kept in stock will service any size 15 motor, either 60 or 400 cps, and will eliminate the procurement delays of integral motor-dampers. Since the damper face and pinion are dimensionally identical to the size 15 motor, it can be added to an existing servo loop to improve its performance, with no change in the gear plate. Other units are available. The ID11-100 fits all size 11 motors, and the ID18-100 is the equivalent damper for size 18 motors.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